

MATSUSHITA ELECTRONICS CORPORATION

TAKATSUKI JAPAN



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Type **5DQP2**

REGISTRATION DATA

Date issued October 21, 1961

National 5DQP2 is a 5-inch flat face oscilloscope tube with single gun, electrostatic focus electrostatic symmetrical deflection, helical post acceleration, metal backed screen and very high deflection sensitivity.

The metal backing of screen further improves the high brightness, and a combination of high deflection sensitivity, the tube can very well be used for high frequency and high writing-speed applications.

ELECTRICAL DATA

Heater Voltage	6.3 Volts
Heater Current	0.3 $\pm$ 10% Amperes
Focusing Method	Electrostatic
Deflection Method	Double Electrostatic
D ₁ — D ₂	Symmetric
D ₃ — D ₄	Symmetric
Direct Interelectrode Capacitances Approximate	
Grid No. 1 to All Other Electrodes	6.4 $\mu\mu$ F
Cathode to All Other Electrodes	4.6 $\mu\mu$ F
D ₁ to D ₂	1.9 $\mu\mu$ F
D ₃ to D ₄	1.5 $\mu\mu$ F
D ₁ to All Other Electrodes	3.5 $\mu\mu$ F
D ₂ to All Other Electrodes	3.5 $\mu\mu$ F
D ₃ to All Other Electrodes	2.8 $\mu\mu$ F
D ₄ to All Other Electrodes	2.8 $\mu\mu$ F
Helical Post Accelerator Resistance	200 to 1000 Megohms

OPTICAL DATA

Phosphor Number	P ₂
Fluorescent Color	Green



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Phosphorescent Color Green
Persistence Long

MECHANICAL DATA

Overall Length 18 1/4 $\pm$ 3/16 Inches
Greatest Diameter of Bulb 5 1/4 $\pm$ 3/32 Inches
Minimum Useful Screen Diameter 4 1/2 Inches
Base (Medium Shell Diheptal 12 Pin) B 12 — 37
Basing
Base Alignment
D₃ — D₄ trace aligns with pin No. 1 and tube axis $\pm$ 10 degrees.
Positive voltage on D₁ deflects beam approximately toward pin No. 11.
Positive voltage on D₃ deflects beam approximately toward pin No. 8.
Bulb Contact J₁ — 21
Bulb Contact Alignment
J₁ — 21 Contact aligns with trace of D₁ — D₂ $\pm$ 10 degrees.
J₁ — 21 Contact is on same side as pin No. 4
Angle between D₁ — D₂ and D₃ — D₄ Trace 90 $\pm$ 2 degrees

MAXIMUM RATING

Post-Accelerator Voltage 12000 Max. Volts DC
Accelerator Voltage 2100 Max. Volts DC
Accelerator Input 6 Max. Watts
Ratio Post-Accelerator Voltage to
Accelerator Voltage 6 Max.
Isolation-Shield Voltage 2200 Max. Volts DC
Deflection Plate-Shield Voltage 2100 Max. Volts DC
Grid No. 3 (Focusing Electrode) Voltage 800 Max. Volts DC
Grid No. 1 Voltages
Negative-Bias Value 200 Max. Volts DC
Positive-Bias Value 0 Max. Volts DC
Positive Peak Value 2 Max. Volts
Peak Heater-Cathode Voltages
Heater Negative with Respect to Cathode 200 Max. Volts
Heater Positive with Respect to Cathode 125 Max. Volts
Peak Voltage between Accelerator and any Deflection Electrode 500 Max. Volts

TYPICAL OPERATING CONDITIONS

Post Accelerator Voltage (Note 1) 10000 Volts DC
Isolation-Shield Voltage (Note 2) 1500 to 1870 Volts DC
Deflection Plate-Shield Voltage (Note 3) 1580 to 1760 Volts DC
Accelerator Voltage (Note 1) 1670 Volts DC



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Grid No. 3 (Focusing Electrode) Voltage 180 to 590 Volts DC
Grid No. 1 Voltage -50 to -80 (Note 4) Volts DC
Deflection Factor D_1 and D_2 70 to 85 Volts DC per Inch
Deflection Factor D_3 and D_4 15.0 to 18.3 Volts DC per Inch
Useful Scan $D_1 - D_2$ 4 Inches
Useful Scan $D_3 - D_4$ 1 5/8 Inches
Focusing Electrode Current for any Operating Condition -15 to +10 Microamperes
Spot Position (Undelected) (Note 5) $\frac{3}{8}$ Inches
For accelerator voltage (Note 1) not shown in the preceeding table, the following can be used as a guide.

Isolation-Shield voltage (Note 2) 90 to 110% of Accelerator Voltage
Deflection Plate-Shield Voltage (Note 3) 95 to 105% of Accelerator Voltage
Grid No. 3 (Focusing Electrode) Voltage 10.8 to 35.3% of Accelerator Voltage
Grid No. 1 Voltage (Note 4) -3.0 to -4.8% of Accelerator Voltage
Deflection Factors

Post Accelerator Voltage = 6 Accelerator Voltage

D_1 and D_2 42 to 51 Volts DC per Inch per Kilovolt of Accelerator
 D_3 and D_4 9 to 11 Volts DC per Inch per Kilovolt of Accelerator

Useful Scan

Post Accelerator Voltage = 6 Accelerator Voltage

$D_1 - D_2$ 4 Inches
 $D_3 - D_4$ 1 5/8 Inches

MAXIMUM CIRCUIT VALUE

Grid No. 1 Circuit Resistance 1.5 Max. Megohms
Resistance in any Deflection Electrode Circuit (Note 6) 5 Max. Megohms

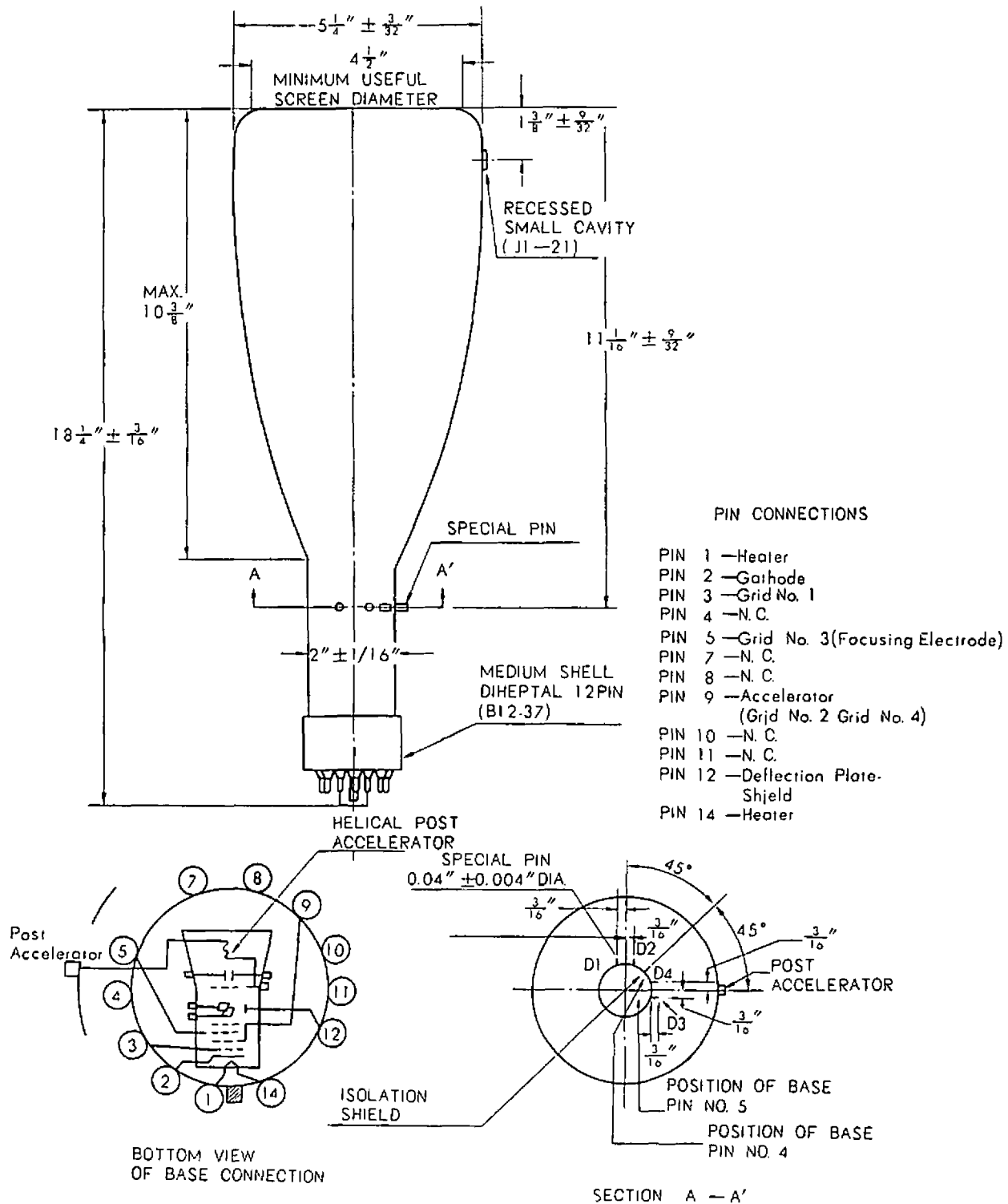
NOTES

1. It is recommended that the post-accelerator voltage is not less than 6000 volts and the accelerator voltage is not less than 1000 volts, in order to obtain the high light output, because screen of this tube is metalbacked.
2. The isolation-shield and lower end of the helical post-accelerator are connected together in the tube. In general the isolation-shield voltage and the average potential of the deflection plates should be equal. Variation of the isolation-shield voltage serves to correct pin-cushion and barrel-pattern distortion.
3. In general the deflection plate-shield voltage and the average potential of the deflection plates should be equal. Adjustment of the deflection plate-shield voltage provides improved linearity of the vertical deflection.
4. Visual extinction of undeflected focused spot.
5. Connect free deflecting electrode to accelerator.
6. It is recommended that the deflecting circuit resistances are approximately equal.



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